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Footprints are given to show the direction of movement; also sledge hunting roads in snow-covered countries; animal paths and fording places and human habitations, whether in the northern tundra or the tropical forest. A fish drawn on land means that there is fine fishing in the neighboring waters. Groups of dots on Wissner's Eskimo maps show where musk-ox herds may be found.

It is impossible in this brief summary to give an adequate idea of the thorough and detailed study of the primitive and early phases of map-making, the results of which are given in this quarto volume of 350 pages. The work embodies the fruits of the most exhaustive examination of this important subject that has yet been made. The author says modestly, in conclusion:

"The considerable material collected and presented here by us speaks for itself. If it should awaken further interest and stimulate further research and investigation, or be used as the basis for other works, we shall feel amply rewarded."

NOTES ON THE DESCRIPTION OF LAND FORMS.—VI.

A CUESTA IN MIDDLE GERMANY. DER STEIGERWALD: ein Beitrag zur Geographie Frankens, by J. Schwender (*Forsch, f. Deut. Landes- u. Volkskunde,* xvii, 1908, 1-118). The studies of German geography, among which the one above cited is published, are now approaching their twentieth volume. They consist of a series of essays by experts on various local themes, accepted with the sanction of a Central Commission for Scientific Geography in Germany, edited at present by Professor Hahn of Königsberg, and published by Englehorn in Stuttgart. The *Forschungen* may therefore be regarded as presenting the various methods of treating geographical problems that are accepted as scholarly and effective by German geographers of high standing. An essay by Sölch in a recent volume was reviewed in the fifth number of these notes, as an illustration of the helpful use of deduction, in addition to other mental processes, in geographical presentation. The essay here cited shows how greatly an approved method of treatment of land forms may vary from the deductive treatment employed by Sölch.

A part of Franconia in northern Bavaria, which, with respect to neighboring cities, lies between Würzburg, Bamberg and Nüremberg—or which, with respect to rivers, lies between a north bend of the Main and its southern branch, the Regnitz; or with respect to dimensions, measures about 70 kil. north and south by 50 kil. east and west; or with respect to structure, occupies a north-central part of the broadly truncated monocline of strong and weak strata that dip gently eastward and southeastward from the fundamental crystallines in the stripped highlands of the Odenwald and Schwarzwald on the west, toward the strong cuesta determined by the uppermost resistant members of the monoclinal series, and known as the Franconian and Swabian Jura on the east; or with respect to topography, is finely portrayed on sheets 531 and 548 of the "*Karte des deutschen Reiches,*" 1:100,000; or with respect to geology, is shown on sheets 18 and 23 of Lepsius' *Geologische Karte des Deutschen Reiches,* 1:500,000—contains a beautiful example of a maturely dissected cuesta of moderate relief and delicate texture, known as the Steigerwald. To the south, the cuesta is continued in the Franken Höhe, but there it is of less delicate and definite expression; to the north, beyond the Main, it fades away with the change of structure encountered in the approach to the disturbed belt of the Thuringerwald.

In the district with which we are here concerned, every element of a maturely dissected cuesta of moderate relief and delicate texture is seen to perfection. Its crest, trending about north and south, and standing about 180 meters above the neighboring subsequent lowlands, maintains the fairly uniform elevation characteristic of this well-defined class of forms; its scarped western face, capped by the lower one of two resistant sandstones of small thickness, and indented by obsequent valleys in perfectly normal fashion, descends gently to the subsequent lowland worn down on the underlying weaker strata and here drained by the Main; its upland is somewhat benched or terraced, most distinctly so in the north, because the two determining resistant sandstones that maintain it are separated by a thin belt of weak marls; its very gradual eastward slope has been normally stripped of the overlying weaker strata of the monocline, which have retreated down the dip into the eastern subsequent lowland drained by the Regnitz, while the still higher and harder strata rise farther eastward in the strong cuesta of the Franconian Jura. The stripped eastward slope of the Steigerwald is, however, not smooth and even, as it might be in a young cuesta, but is maturely dissected; that is, it is elaborately carved by many beheaded consequent streams and their more numerous, somewhat insequent branches;—though for that matter it may be better to describe these consequents as resequents, in view of their presumable re-development after the far eastward retreat, probably in an earlier cycle of erosion, of the overlying Jura strata.

Guided by this description, one can imagine himself wandering over the cuesta, and easily conceive the wide prospect westward over the subsequent lowland of the Main, disclosed from the crest of the scarped slope; the picturesque re-entrants of the obsequent valley heads by which the face of the slope gains a pleasing variety of form; the occasional distant views from the uplands eastward across the subsequent Regnitz lowland to the Franconian Jura 40 or 50 kilometers distant; the long, slowly-descending strips of upland between the consequent (resequent?) valleys of eastward discharge; and the many small spurs of delicate texture between the short and somewhat irregular branch-streams by which the sides of the consequent valleys are scalloped; all these features being conceived as having a mild expression, because the relief is at the outset described as moderate. Even an active physiographic imagination can hardly invent a more perfect type of a maturely dissected cuesta than the one that nature presents to us in the Steigerwald, in the middle of the broadly truncated Franconian monocline. When the large family of cuestas is monographed, as we hope it may be in the near future, the Steigerwald will surely have an important place as an unusually fine example that exhibits all the normal and systematic relations of structure, drainage and form, characteristic of the mature stage of cuesta development.

It is this exceptionally fine example of its prolific class that Schwender describes, partly empirically, partly genetically, in the first twelve pages of his essay—the remaning hundred pages being devoted to a more detailed discussion of population, settlement, traffic and local names. The first page, opening with the sentence:—"Steigerwald nennt man den Höhenzug, der sich zwischen Main, Aisch und Regnitz in nordnordöstlicher Richtung erstreckt"—continues with a detailed and purely empirical statement of the boundary of the district, phrased for the most part in terms of village names, but in the meantime the thing that is bounded remains practically unknown, except in so far as the vague term, Höhenzug, describes it. Then come three pages on internal structure, with abundant geological detail, all of which must be gone through by the reader not previously acquainted with the district, because it is not summarized, and not illustrated by a cross-section. Three or more pages follow on the origin of the Höhenzug, its form being still vaguely described; these pages are introduced by the elementary explanation that the overlying strata, now seen in the lower land to the east, once stretched westward over the Steigerwald, thus giving its district a much greater height, and that the strata of the Steigerwald itself once extended much farther westward, thus giving the mass a greater breadth. "The present Steigerwald is therefore only the remnant of a formerly much larger volume, and if we here treat of its origin, we must show how the small existing ridge has been produced from the once much greater mass, . . . and particularly how the retreat of the scarp in the direction of the dip of the strata is to be explained." This somewhat apologetic statement is followed by a rather roundabout explanation of the familiar lateral retreat of a monoclinal escarpment. Three more pages treat external form, and present various details regarding the scarp, the uplands and the eastern valleys, but with little relation to structure. Then the physiographic description is closed with two pages on "hydrographic relations," in which the various streams of the district are named and briefly characterized. In the remaining pages, other problems are treated in greater detail.

Through these twelve pages of Schwender's essay, the elementary problem of the Steigerwald cuesta is treated as if it were a novelty; as if this

"Höhenzug" were a unique form. There is no hint that another cuesta is to be found anywhere else in the world, no intimation that cuestas are familiar physiographic features. The reader gains no information as to the rank of the Steigerwald among its relatives; no intimation as to its being higher or lower, stronger or fainter, simpler or more complicated than other forms of its kind; not a suggestion even that it is a member of a class of forms. It stands alone; a waif, a foundling. There must, of course, be some good reason for the adoption of this method of isolated treatment by the author, for its sanction by the Central Commission for Scientific Geography in Germany, and for its acceptance by the editor of the *Forschungen;* but the reason is not immediately apparent..

A feature characteristic of isolated treatment is the insufficiency of technical geographical terms. True, in the section on internal structure, technical geological terms, such as *Schilfsandstein*, *Berggipskeuper* and *Lehrbergschichten* abound; in the mention of forests, there is no hesitation in saying that *Buchenwälder* clothe the scarp, and *Föhrenwälder* cover much of the uplands; or that *Nadelholz* prevails in one district and *Laubholz* in another; and in the account of the villages, each type of house-grouping is, following Schlüter, given a suggestive class name, such as *Strassendorf*, *Gassendorf*, *Platzdorf and Haufendorf;* but for the cuesta itself, no other name is employed than the altogether indefinite "Höhenzug." Other terms, such as "Rand" and "Abhang" for scarp, "Kamm" for crest, "Abdachung," for the slope of the upland, and "durchschnittene Hochfläche" for dissected upland, are more appropriate; but the use of these names for the parts by no means excuses the lack of a definite name for the whole.

A word used by some German writers for forms like that of the Steigerwald is "Stufe." Perhaps this term is avoided by Schwender as unsatisfactory because it is also applied by German writers to cliffs and benches of horizontal structure, while the essential features of form in the Steigerwald result from its structure being gently inclined. British usage sanctions, in a rather vague way to be sure, the use of "escarpment" for the whole mass of which the escarpment or scarp is, properly speaking, only the steeper side; confusion naturally results from giving the same name to a part and to the whole. "Lop-sided ridge" is an off-hand American suggestion that serves well enough colloquially, but that has not gained acceptance as a technical term. Veatch has recently suggested for American use the British word "wold." In the absence of any generally accepted term, Hill's earlier proposal of "cuesta" as a name, following Spanish-American usage, for unsymmetrical ridges of this kind has for some years seemed to me more satisfactory than any other, notwithstanding the objection urged by some that *cuesta* in Spanish means any sort of hill, and not only this particular kind of relief. A similar objection may, indeed, be used also against Richthofen's term, "ria" (*Führer für Forschungsreisende,* Berlin, 1886, 308), which in Spanish means, as Penck has pointed out, an open river mouth of any kind, and not specifically a bay formed by the partial submergence of a normal valley (Morphologie der Erdoberfläche, Stuttgart, 1894, ii, 566, note) ; yet ria has gained rather general acceptance in Germany, where cuesta is little used. In any case, it seems inexpedient, to say the least, to continue using vague words like "Höhenzug," or terms with other meaning, like "Stufe," or indefinite paraphrases like a "ridge of unsymmetrical slopes," for forms so definite in their relations and so common in many parts of the world as cuestas certainly are.

Consistent with his exclusion of a technical name for the "Höhenzug" of the Steigerwald, Schwender employs no technical terms to name the different kinds of streams by which it is so systematically dissected; and hence when streams are mentioned in the later chapters on roads, villages and so on, he has to resort to paraphrases, or else to local stream names which suggest no general relationships. In conclusion it may be fairly said that one seldom meets with a regional description in which a brief systematic introduction, phrased in appropriate technical terms and simply illustrated, would be more fitting, and in which the absence of such an introduction more seriously embarrasses a reader not already acquainted with the ground.

AMATEUR GEOGRAPHY. In *Nature* for Dec. 8, 1910, page 178, is a paragraph commenting on the recommendation made in these Notes (xlii, 1910, 671-675) that technical explanatory terms and phrases should be more generally employed in geographical articles than is now the case. The comment says, in a remonstrating tone, that explanatory terms "might be more misleading than any empirical description if employed wrongly or applied without sufficient warrant. It is not every traveller who could be trusted with the use" of such terms, even though they "may be used with good effect by a physiographer of experience."

On the same page of *Nature,* or on neighboring pages, one may read that fishing is dangerous "where *Glossina palpalis* is found"; and mention is made of a harmful insect, "*Denoderus minutus*"; also of a "*grass-like umbellifer, Aciphylla glacialis,*" and of "the valuable gold-lip, *Margaritifera maxima*"; and so on, in abundance. Yet none of these scientific or explanatory terms excite remonstrance; in none of these cases is it urged that technical terms "might be more misleading than any empirical description if employed wrongly or applied without sufficient warrant"; and no fear is expressed that "not every traveller" can be trusted with the use of these learned words.

What then is the ground of discrimination against geography in this matter? Why is it that an effort to reach a fair degree of proficiency and expertness in this worthy, but undeveloped old science, arouses misgivings? Perhaps the reason is that *Nature* counfounds travellers and geographers, although it does not confound travellers and zoologists, travellers and botanists, or travellers and ethnologists. But what have mere travellers to do with the question? The article regarding which the note in favor of the development and use of technical terms was written, did not appear in the records of a traveller's club, where amateurs might very properly entertain themselves and each other with dillettante narratives of their distant experiences, but in one of the leading geographical journals of the world. There, if anywhere, is it fair to look for expert geographical work; and if an article in such a journal bears the mark of the scientifically untrained traveller, and not of the trained geographer, it is reasonable to urge that it should be improved in the way of geographical proficiency.

Consider what would happen if that entertaining person, the traveller, should present an untechnical account of his observations on certain plants to the Linnæan Society, and ask for its publication in their journal; assume for a moment that publication was granted, and that the members of that learned society were thus informed regarding the occurrence of a flower, in which the flower-stems spread out from a common center, so that the blossoms met above in a gently convex surface of approximately circular border. Imagine then that a botanist on reading this naive story should suggest that "such flowers might be more briefly described as umbellifers." Would *Nature* then comment on such a suggestion by saying that "a term like umbellifer might be more misleading than any paraphrase if wrongly employed"? Comments of that kind would be perfectly true; but they would be mere truisms, and in the case of botany and zoology *Nature* would not make them. Why then, in view of the progress of these organic sciences as cultivated by experts, does *Nature* assume that geography must remain a subject for amateurs only?

My acquaintance with *Nature* extends intermittently over about forty years. I recall various occasions on which its editorials and reviews have taken advanced ground in favor of high scientific standards, and no occasion previous to the one here instanced, in which it urged investigators to restrain their efforts towards progress because mistakes might be made if their terms and explanations were wrongly employed by uninformed persons; no case in which this famous scientific journal advised that thoughtful effort towards progress in geography or in any other subject should be decreased because "travellers" are not always technically educated. To find that articles in the best geographical journals of the world are still largely the work of "travellers," little informed regarding the scientific description of the earth's surface, is already discouraging enough; but to find that *Nature* should use its large influence in favor of lagging behind with geographical amateurs, instead of urging geographers to take the pace that it sets for other sciences, is disappointing indeed.

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